

**ABSTRACT OF THE DISCLOSURE**

The effect of resist poisoning may be eliminated or at least substantially reduced in the formation of a low-k metallization layer, in that a nitrogen-containing barrier layer is provided with a surface modified by plasma treatment. Consequently, diffusion of nitrogen and nitrogen compounds in vias formed in the low-k dielectric layer is significantly suppressed, so that in a subsequent photolithography step interaction of nitrogen and nitrogen compounds with the photoresist is remarkably reduced.